



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-------------------------|------------------|
| 09/862,827 | 05/22/2001 | Jack A. Mandelman | FIS920000224US2(13814A) | 9621 |

7590

01/29/2003

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza
Garden City, NY 11530

EXAMINER

LEWIS, MONICA

ART UNIT PAPER NUMBER

2822

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,827

Applicant(s)

MANDELMAN ET AL.

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 53-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 53-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the response filed November 14, 2002.

Response to Arguments

2. Applicant's arguments with respect to claims 53-59 have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 53-56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what is meant by the following: "gate conductor guard ring prevents trapping of a stringer of polysilicon on said isolation region" (See Claim 53). There is nothing in the claim that states where the polysilicon is located. Claims 54-56 depend directly or indirectly from a rejected claim and are, therefore, also rejected under 35 U.S.C. 112, second paragraph for the reasons set above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 53-56, as far as understood, are rejected under 35 U.S.C. 103(a) as obvious over Schrems et al. (U.S. Patent No. 5,945,704) in view of Gambino (U.S. Patent No. 6,174,756) and Leung et al. (U.S. Patent No. 6,075,720).

In regards to claim 53, Schrems et al. ("Schrems") discloses the following:

- a) at least one array region (See Figure 1 and Column 3 Lines 28-33).
- b) an isolation region (See Figure 1 and Column 3 Lines 28-33).

In regards to claim 53, Schrems fails to disclose the following:

- a) support region.

However, Gambino et al. ("Gambino") discloses a support region (See Column 2 Lines 22-38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a support region as disclosed in Gambino because it aids in providing an efficient formation of an integrated circuit (See Column 1 Lines 65 and 66 and Column 2 Lines 1-11).

Additionally, since Schrems and Gambino are both from the same field of endeavor, the purpose disclosed by Gambino would have been recognized in the pertinent art of Schrems.

b) at least a gate conductor guard ring formed around said array region on top of said isolation region, wherein said gate conductor guard ring prevents trapping of a stringer of polysilicon on said isolation region.

Art Unit: 2822

However, Leung et al. ("Leung") discloses a guard ring (See Column 5 Lines 37 and 38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a guard ring as disclosed in Leung because it aids in preventing latch up from occurring (See Column 5 Lines 37 and 38).

Additionally, since Schrems and Leung are both from the same field of endeavor, the purpose disclosed by Leung would have been recognized in the pertinent art of Schrems.

In regards to claim 54, Schrems discloses the following:

a) array region includes a plurality of DRAM cells embedded in a semiconductor substrate (See Figure 1 and Column 3 Lines 28-30).

In regards to claim 55, Schrems discloses the following:

a) wordlines (120) overlay each of said DRAM cells and a bitline (185) overlays said wordlines (See Figure 3).

In regards to claim 56, Schrems discloses the following:

a) each of said DRAM cells are vertical DRAMs (See Figure 1).

8. Claims 57-59 are rejected under 35 U.S.C. 103(a) as obvious over Schrems et al. (U.S. Patent No. 5,945,704) in view of Gambino (U.S. Patent No. 6,174,756) and Yeh et al. (U.S. Patent No. 5,897,371).

In regards to claim 57, Schrems discloses the following:

a) at least one array region having at least one wordline formed therein (See Figure 1 and Column 3 Lines 28-33);

b) an isolation region (See Figure 1 and Column 3 Lines 28-33).

In regards to claim 57, Schrems fails to disclose the following:

a) one support region having a local interconnect formed therein.

Art Unit: 2822

However, Gambino discloses a support region (110) with an interconnect (See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a support region with an interconnect as disclosed in Gambino because it aids in providing an efficient formation of an integrated circuit (See Column 1 Lines 65 and 66 and Column 2 Lines 1-11).

Additionally, since Schrems and Gambino are both from the same field of endeavor, the purpose disclosed by Gambino would have been recognized in the pertinent art of Schrems.

b) at least one wordline and said local interconnect are comprised of identical material.

However, Yeh et al. ("Yeh") discloses a wordlines and interconnects made of the same material (See Column 3 Lines 39-45). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include wordlines and interconnects made of the same material as disclosed in Yeh because it aids in lowering contact resistance (See Column 3 Lines 39-62).

Additionally, since Schrems and Yeh are both from the same field of endeavor, the purpose disclosed by Yeh would have been recognized in the pertinent art of Schrems.

In regards to claim 58, Schrems discloses the following:

a) array region includes a plurality of DRAM cells embedded in a semiconductor substrate (See Figure 1 and Column 3 Lines 28-30).

In regards to claim 59, Schrems discloses the following:

a) each of said DRAM cells are vertical DRAMs (See Figure 1).

Art Unit: 2822

Conclusion

9. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Witek et al. (U.S. Patent No. 6,146,970) discloses a capped shallow trench isolation; b) Huang (U.S. Patent No. 6,274,471) discloses a semiconductor device with high aspect ratio contacts; and c) Schnabel et al. (U.S. Patent No. 6,291,335) discloses split level wiring.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

January 23, 2003


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800